

## **What is claimed is:**

**[Claim 1]** A data receiver operable to receive a signal controllably pre-distorted and transmitted by a transmitter, to generate information for adjusting the pre-distortion applied to the signal transmitted by the transmitter, and to transmit the information to the transmitter, the data receiver further being operable to perform adaptive equalization to receive the signal transmitted by the transmitter.

**[Claim 2]** The data receiver as claimed in claim 1, comprising a decision feedback equalizer operable to perform the adaptive equalization of the signal received from the transmitter.

**[Claim 3]** The data receiver as claimed in claim 2, wherein the information includes information for adjusting a characteristic of a feed forward equalizer (FFE) of the transmitter.

**[Claim 4]** The data receiver as claimed in claim 3, wherein the information for adjusting a characteristic of the FFE includes information for adjusting tap coefficients of the FFE.

**[Claim 5]** The data receiver as claimed in claim 1, being further operable to compensate a direct current (DC) voltage offset of the signal.

**[Claim 6]** The data receiver as claimed in claim 5, comprising a digitally controlled reference current generator operable to compensate the DC voltage

offset, the reference current generator controlled as a result of the adaptive equalization.

[Claim 7] The data receiver as claimed in claim 4, further comprising an automatic gain control unit operable to amplify the received signal to a predetermined level.

[Claim 8] The data receiver as claimed in claim 7, wherein the automatic gain control unit includes a variable gain amplifier and a peaking amplifier, such that in a first mode, the variable gain amplifier is operable to amplify the signal received from the transmitter to a predetermined level and the peaking amplifier is operable to amplify the signal substantially without peaking, and in a second mode, the variable gain amplifier is operable to amplify the signal with fixed gain and the peaking amplifier is operable to amplify the signal with peaking.

[Claim 9] The data receiver as claimed in claim 8, wherein the peaking amplifier is operable in the first mode to amplify the signal with fixed peaking, and is operable in the second mode to amplify the signal with variable peaking, the variable peaking being adjustable in relation to a characteristic of the received signal.

[Claim 10] The data receiver as claimed in claim 8, wherein the gain of the variable gain amplifier is automatically adjusted as a result of the adaptive equalization performed by the data receiver.

[Claim 11] A data receiver, comprising:

an automatic gain control unit including a variable gain amplifier and a peaking amplifier, such that in a first mode, the variable gain amplifier is operable to amplify a data-carrying signal from a transmitter to a predetermined level and the peaking amplifier is operable to amplify the signal substantially without peaking, and in a second mode, the variable gain amplifier is operable to amplify the signal with fixed gain and the peaking amplifier is operable to amplify the signal with peaking;

a decision feedback equalizer ("DFE"), operable to determine values of transmitted data bits from the signal amplified by the automatic gain control unit, the DFE operable in the first mode to perform equalization, and operable in the second mode to perform without equalization;

an equalization processor operable to generate first information for adaptively adjusting the equalization performed by the DFE in the first mode, and operable to generate second information for adjusting the pre-distortion applied to the data-carrying signal by the transmitter; and

an up-channel transmitter operable to transmit the second information to the transmitter on a transmission channel to which the data receiver is connected for receiving the data-carrying signal from the transmitter.

[Claim 12] The data receiver as claimed in claim 11, including a circuit operable to compensate a direct current (DC) voltage offset of the signal.

[Claim 13] The data receiver as claimed in claim 12, wherein the circuit includes a digitally controlled reference current generator, controlled in response to information generated by the equalization processor.

[Claim 14] A method of receiving data from a data-carrying signal transmitted by a transmitter, comprising:

receiving values of data bits from the data-carrying signal with equalization at the receiver;

generating first information for adjusting an amount of the equalization performed at the receiver;

generating second information for adjusting an amount of pre-distortion applied to the data-carrying signal by the transmitter; and

transmitting the second information to the transmitter.

[Claim 15] The method as claimed in claim 14, wherein the second information includes information for adjusting a characteristic of a feed forward equalizer (FFE) of the transmitter.

[Claim 16] The method as claimed in claim 15, wherein the information for adjusting a characteristic of the FFE includes information for adjusting tap coefficients of the FFE.

[Claim 17] The method as claimed in claim 14, further comprising compensating a direct current (DC) voltage offset of the data-carrying signal at the data receiver.

[Claim 18] The method as claimed in claim 17, further comprising controlling an amount of the DC voltage offset compensation as a result of the equalization performed at the receiver.

[Claim 19] The method as claimed in claim 14, further comprising using an automatic gain controlled amplifier at the receiver to amplify the data-carrying signal to a predetermined level.

[Claim 20] The method as claimed in claim 19, wherein the automatic gain controlled amplifier includes a variable gain amplifier and a peaking amplifier, such that in a first mode, the variable gain amplifier amplifies the data-carrying signal to a predetermined level and the peaking amplifier amplifies the data-carrying signal substantially without peaking, and in a second mode,

the variable gain amplifier amplifies the signal with fixed gain and the peaking amplifier amplifies the signal with peaking.

[Claim 21] The method as claimed in claim 20, further comprising adjusting the gain of the variable gain amplifier automatically as a result of receiving the data with equalization.